



# The Black Country Geological Society

NEWSLETTER NO. 128

APRIL 1998

The Society does not provide personal accident cover for members or visitors on field trips. You are strongly advised to take out your own personal accident insurance to the level you feel appropriate. Schools and other bodies should arrange their own insurance as a matter of course.

Leaders provide their services on a purely voluntary basis and may not be professionally qualified in this capacity.

The Society does not provide hard hats for use of members or visitors at field meetings. It is your responsibility to provide your own hard hat and other safety equipment (such as safety boots and goggles/glasses) and to use it when you feel it is necessary or when a site owner makes it a condition of entry.

Hammering is seldom necessary. It is the responsibility of the hammerer to ensure that other people are at a safe distance before doing so.

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## FUTURE PROGRAMME

Lecture meetings are held in the Banquet Room (Dudley Suite) at the Ward Arms Hotel, Birmingham Road, Dudley. Phone: (01384) 458070. 7.30 p.m. for 8 o'clock start.

MONDAY 27th APRIL. Lecture 'Hidden secrets of some Carboniferous Corals' by Dr. John Nudds (Manchester Museum).

This lecture looks at some common species of corals of the Carboniferous period, and in particular at morphological features and variations that occurred in them. It will show that these variations can reveal a wealth of information about the environment, palaeogeography and even the astronomy of the times when they were growing. The lecture will also illustrate rejuvenescence (*i.e. how a species can evolve 'backwards' to a less-developed form*), diurnal growth lines, microstructure, and other unusual features which can be seen by microscopic examination of these corals.

DR. NUDDS graduated at Nottingham University then obtained his PhD at Durham studying Carboniferous rugose corals. This was followed by a 3 years Fellowship at Trinity College Dublin, staying in Ireland for a further 8 years, latterly as Curator of TCD Geological Museum. Currently he is Keeper of Geology at Manchester University Museum, and is also Chairman of the Geological Curators Group.

SUNDAY 10th MAY - Field meeting to Shropshire to study the Cambrian and Ordovician strata.

Leader: Dr. Paul Smith (Birmingham University).

Paul Smith led a field meeting for us last year looking at Silurian strata in Shropshire, and this meeting will complement it by studying Cambrian and Ordovician rocks around Church Stretton and also the well-known section along the River Onny near Craven Arms.

MEET 10.30 a.m. at the main car park in Church Stretton (GR: 453936). When travelling along the A49 Ludlow-Shrewsbury road, turn into Church Stretton at the traffic lights. After 200 yards turn left into the car park.

Site to be visited will probably include:

\* Comley Quarry (GR 484964) a classic site near Church Stretton for the Lower Comley Sandstone and Limestone (Lower Cambrian).

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- \* Hope Bowdler unconformity (GR 474294) with Harnage Shales (Ordovician) resting unconformably on Uriconian Volcanics (Precambrian).
- \* Alternata Limestone (Ordovician) at Chatwall (GR 514975).
- \* Onny Valley section (GR 429852 to 411861) showing a spectacular sequence of Ordovician strata exposed along the River Onny for a distance of over a mile.

DR. PAUL SMITH is Curator of the Lapworth Geological Museum, Birmingham University, and he is also on the academic staff of the School of Earth Sciences. He is one of our own members and has been a good friend of the Society in many ways, lecturing and leading field meetings, also welcoming members to the Museum for displays and lectures there.

SATURDAY/SUNDAY 13/14th JUNE. WEEKEND FIELD MEETING to Hertfordshire based at St. Albans. Leader: Dr. John Catt (Quaternary Geologist, Rothamstead Experimental Station, Harpenden).

This geological weekend will give us a chance to see horizons not normally available to those of us living in the West Midlands, in particular we will visit exposures from the Cretaceous, Tertiary and Quaternary periods. These will include Lower, Middle and Upper Chalk at Totterhoe and other sites, the famous Hertfordshire Puddingstone in situ and in buildings, Lower Greensand at Leighton Buzzard/Woburn Sands and a range of glacial features.

A SHEET GIVING DETAILS AND AN ENQUIRY FORM FOR THE WEEKEND WAS IN THE FEBRUARY NEWSLETTER.

Further details from: Paul Shilston 16 St Nicolas Gardens, Kings Norton, Birmingham B38 8TW. Tel 0121 459 3603.

FRIDAY 21st - SUNDAY 23rd JUNE. Geologists Association weekend field meeting to Norfolk. BCGS members are welcome to attend. Details and booking arrangements will be announced later.

SUNDAY 5th JULY. Whole day field meeting to Snailbeach historic site and Old Mine looking at the surface features with an underground visit to the mine. Snailbeach (O.S. Grid Ref: 372022) is approximately 16km (10 miles) south-west of Shrewsbury. Leader: Peter Sheldrake (Retired Shropshire County Council Environmental Dept).

Meet at 10.30 a.m. at the Village Hall car park at Snailbeach. To get there from the Shrewsbury by-pass, turn off the by-pass onto the A488 signed to Bishops Castle, then after 8 miles turn left at Plox Green and continue to Snailbeach. The village hall car park is on the right just after entering the village.

The visit will comprise a one and a half hour tour around the surface features with a lunch stop at the nearby public house, followed by a one and a half hour underground trip. Those who wish to go underground will need wellingtons, hard hat and a powerful torch and clothing which does not matter or overalls. The adit is approximately 5ft high therefore no crawling is necessary. We will go into a large stope with plenty of headroom and up a fairly steep scree slope for the more athletic.

Mining at Snailbeach dated back to Roman times and lasted until the 1950's. The mine principally produced galena (lead Sulphide) and some sphalerite (Zinc Sulphide) and barytes (Barium Sulphate) and there were smelting activities on the site. The mine site has been restored from a derelict state to provide a fascinating historic display. The visible surface features include a spoil heap of ore and rock, a chimney with a brick flue some hundreds of metres long running from the smelting plant, mine adits and a range of buildings for the mining activity, including the locomotive shed for the mineral railway which ran to join the main line at Pontesbury.

PETER SHELDRAKE has been closely involved with the restoration of the mine and the surface features by Shropshire County Council. He will conduct the tour, both above and below ground. He ran the previous trip to Snailbeach in June 1997.

HARD HATS are required for this field meeting - MEMBERS MUST PROVIDE THEIR OWN.

Lunch at the nearby Public House for this field meeting - The Styer Stones Inn, does do Sunday Lunches and bar meals.

FRIDAY 21st - MONDAY 24th AUGUST. Geologists Association weekend field meeting to the Edinburgh area. BCGS members are welcome to attend. Details and booking arrangements will be announced later.

SUNDAY 27th SEPTEMBER. Field meeting to Southam Quarry and Burton Dassett. Leader: John Crossling (Warwickshire Museum).

MONDAY 26th OCTOBER. Lecture: "A glimpse of Namibian geology with an excursion to Kimberley and its diamonds" by Dr. A.C. Waltham (Nottingham Trent University).

MONDAY 9th NOVEMBER. Lecture: "the Miravelles geothermal system, Costa Rica". By Dr. C.A. Rochelle (British Geological Survey, Nottingham).

MONDAY 30th NOVEMBER. Lecture on mineralogy by Spencer Mather (Society Member).

## EDITORIAL

Alf Cole has mentioned to me an article in a newspaper warning about infringements of copyright by organisations using and duplicating items from the papers. I have always been a little anxious about this and do not wish to be the subject of a legal suit. I was advised that as long as we published the name and date of the newspaper we were merely providing advertising material. If any of our members have technical knowledge about the matter I would be pleased to hear it. My suggestion would be that we keep a scrap book of press cuttings which is made available to members at meetings. I would be happy to co-ordinate the same and it would be a small price to pay for freedom from prosecution. Or is cutting up newspapers also prohibited!

## REPORTS

### Report of Lecture by Paul Shilston on Yellowstone Park and Yosemite on Monday 19th January

We were deprived of our trip to Greenland courtesy of Dr. Smith, by an unfortunate accident in his family. Instead we had an evening in much warmer regions guided by Paul Shilston, a master craftsman at filling holes in programmes.

The first visit was to Yellowstone National Park, Wyoming, the very first National Park created around about half of the world's geysers. continuity of these geysers is certain since they are produced by one of the world's hot-spots. These hot-spots remain in place even though the continental plate is drifting.

Approach to the park is over the Maddison river terraces past a large lake formed in 1959 after a sudden landslip created a dam. So far the dam is holding.

The great quantity of hot water produced in Yellowstone gives rise to two contrasting types of deposit. Acidic water gives large acreages of geyserite, a form of silica. Where it is cool enough algae make the deposits extremely colourful in contrast to alkaline travertine in other parts of the park. Here the travertine forms vast areas of dazzling white ever expanding shallow basins.

The advent of satellite mapping has revealed that Yellowstone is in reality a huge caldera with an edge of metamorphosed rhyolite. The Yellowstone river flows through a deep canyon breaking the rim where the rhyolite has been rolled by hot thermal fluids.

Geysers are everywhere in the park varying from spluttering little pools to "Old Faithful" and the Grand Geyser (150 ft high). Steady return of the ejected water to the deep underground cisterns ensures regular eruption of many of the large geysers. Most of the park is at 8,000 ft but all the underground heat ensures unfrozen ground even in the depths of winter. For further geological interest there is an area of earth pillars formed in volcanic ash.

Yosemite Park is a complete contrast, consisting of granite plutons up to four miles across. Through the granite is of Carboniferous age there is little cover left, almost all traces have been removed by ice action. There are plentiful examples of glacial striations on the rounded granite. One consequence of removal of pressure from the over-burden is exfoliation of blocks. Perhaps if you stand still long enough you will hear it crackling.

Many of the granite 'lumps' form spectacular mountains. Anyone with the least bit of climber in their blood will have heard of El Capitan - 3,000 ft of almost vertical rock. With commendable American directness one mountain is called 'Half Dome' reaching 9,000 ft. Paul rather spoilt his image by admitting he reached the top by going round the back.

Thank you Paul for an entertaining and instructive evening.

John Collins

### Report of AGM on Monday 23 February 1998

This meeting was attended by 34 members. The Chairman's report noted a pleasing rise in membership. During 1997 the society has been consulted by organisations including Dudley MBC, English Nature, Babbie Group, ECO record and The Urban Wildlife Trust about various proposed developments, Quarrying and Management plans. The society is also represented on local RIGS groups and a number of local organisations.

Paul Shilston has retired as Meetings Secretary and the post has been divided into two. Lecture Meetings Secretary will be Gordon Hensman and Field Meetings will be co-ordinated by Catherine Eames. The committee was returned unopposed and Martin Normanton is Honorary Auditor.

On display at the meeting were samples of the new sweatshirts with the BCGS Logo and costing £11.75 each. Orders to Chris Jowitt on 0121 4366681

### Report of Lecture 'Laterites can be Fun' by Dr. Des Bowden (Newman College and a Society member) on Monday 23rd February

Laterites are the result of long continued weathering under tropical moist conditions. The process gives tropical soils their characteristic red colour, because leaching and chemical weathering leads to a concentration of Fe, Al and Si and oxides in the upper layers of the profile. Weathering in the tropics with high temperatures and humidity leads to fine grade clay material, which may indurate on exposure to the atmosphere. Where the laterite does indurate as a result of vegetation removal by farming practices or increased erosion a duricrust may form.

A good general definition restricts the term laterite to highly weathered material which is:

Rich in secondary forms of iron or aluminium

Poor in humus

Depleted bases and combined silica with or without non-diagnostic substances such as quartz and silicate clays

Which is hard or subject to hardening on exposure to alternate wetting and drying (after Sivarajasingham, Alexander, Cady and Cline 1962)

The depth of weathering may be very deep, perhaps as much as 60 m but up to 20 m is common. A profile develops (see figure). The model of landscape development, water table fall and laterite development proposed by McFarlane (1976) was discussed. She shows how different textural types of laterite, such as vermiform and pisolithic, are related to the development of the whole landscape system.

In Sierra Leone duricrusted footslope benches were investigated on the isolated hill masses which arise above the interior plain. In particular the Kasewe Hills were investigated, these are akin to the Malvern Hills but covered in rainforest and inhabited by six or seven primate species plus people of the Temne and Mende nations. Bench features were described, there being up to five different levels around the Kasewe Hills. Where duricrusting has occurred only thatch grass will grow. In areas where rotational bush fallow farming can still be practised, upland rice is the staple subsistence crop. Fallow periods should be left for some 20 years, although rising population has forced farming to reduce the fallow period to seven or eight years.

Pseudo-karst scenery has developed on these benches. the duricrust acts as a capping rock with the softer weathering horizons being eroded away by subterranean drainage so that, collapses, caves and other landforms similar to those in limestone landscapes develop.

The evidence from the Kasewe Hills showed that laterites could develop, be weathered and eroded both mechanically and chemically, and reform downslope.

In the Gambia laterite and duricrust development are associated with major terrace levels. In the western Gambia there is a lower terrace and up country a higher plateau terrace is found. In Bafoloto Quarry (near Yundum Airport) local people are pleased to earn a cash income by quarrying laterite and selling it as building materials, particularly gravel and building blocks.

In the Western Ghats, India, the high laterites (4,500 - 4,800 feet) had developed because of etchplanation. This resulting etchplain had been dissected subsequently by later deep valley incision. Etchplains are the result of the development of deep weathering profiles over a protracted period, leaving scattered remnants of the original surface as duricrust cappings to plateau tops, with a much younger landscape developing below.

Some references:

Bowden, D.J. (1980) 'Sub-laterite cave systems and other pseudo-karst phenomena in the humid tropics: the example of the Kasewe Hills, Sierra Leone. Zeitschrift für Geomorphologie N.F. Vol 24 No. 1 pp 77-90

Bowden, D.J. (1987) On the composition and fabric of the footslope laterites (duricrust) of Sierra Leone, West Africa, and their geomorphological significance. Zeitschrift für Geomorphologie N.F. Suppl. Bd. 64, 39-53, May 1987.

Bowden D.J. (1997) The geochemistry and development of lateritized footslope benches: The Kasewe Hills, Sierra Leone. Chapter in M. Widdowson (ed.) (1997), Paleosurfaces: Recognition, Reconstruction and Environmental Interpretation. Geological Society Special Publication No. 120, pp 295-305.

McFarlane, M.J. (1976) Laterite and Landscape Academic Press.

Sivarajasingham S, Alexander L.T., Cady J.G. and Cline M.G. (1962) Laterite Advances in Agronomy 14 pp 1-60.

Thomas, M.F. (1994) Geomorphology in the Tropics Wiley

- Des Bowden -

ITEMS IN BRIEF

1. Welcome to new members

Ishmael Patel of Oxford and Wednesbury  
Elaine Ashbee of Quinton  
Colin Marriott of Sutton Coldfield

2. Paul Shilston has a report on BCGS published in the February edition of 'Down to Earth'.

3. Residential Study Tour. University of Nottingham, Department of Continuing Education.  
Geology of the Hawaiian Islands 27 Feb - 14 March 1999 £1700  
Contact Mrs Helene Torr, University of Nottingham, Department of Continuing Education,  
14-22 Shakespeare Street, NG1 4FQ.

4. Congratulations to Sally Crowton on gaining a BSc 2/1 in Earth Sciences from the Open University.  
Sally is an enthusiast of the Earth Sciences and Planetary Studies and hopes to achieve a PhD one day.

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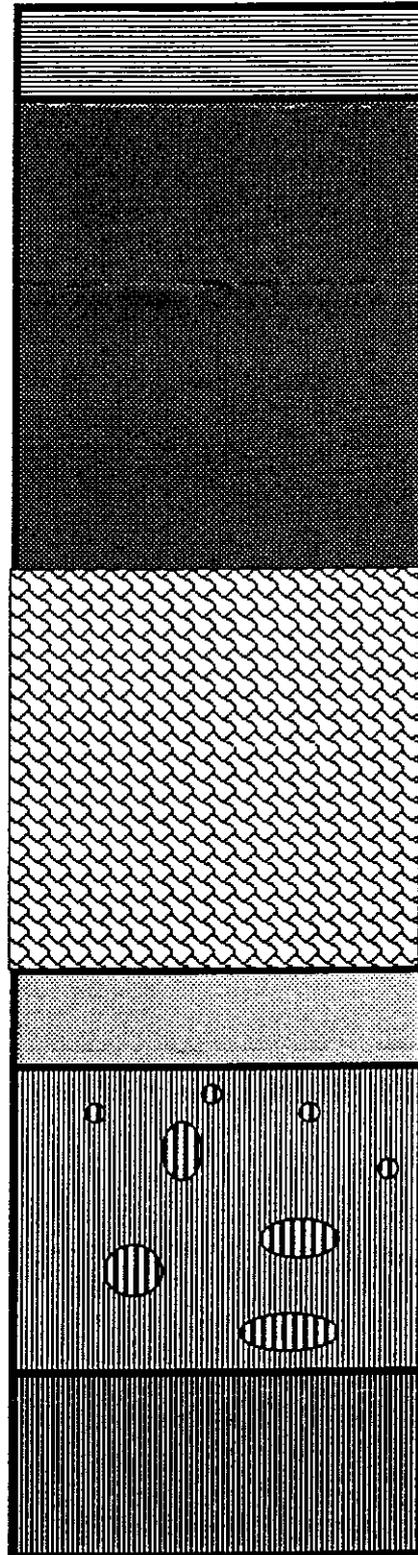
# LATERITE PROFILE

Rapid recycling of nutrients  
through vegetation

Result of leaching

Alternately saturated and  
dry horizons

A secondary feature: not  
observed in Sierra Leone



Very thin top soil

Laterite horizon

Mottled Zone

Pallid zone

Weathered bedrock  
and core stones

Bed rock separated  
from weathering  
horizons by  
weathering front